SYMMETRICAL PACKAGE FOR SEMICONDUCTOR DIE

Allen K. Lam

Richard K. Williams

Alex K. Choi

ABSTRACT

A semiconductor package contains a plurality of sheet metal leads that are attached to one or more terminals on a top side of a semiconductor die. A heat sink is attached to a terminal on a bottom side of the die. Each of the leads extends across the die and beyond opposite edges of the die and is symmetrical about an axis of the die. At the locations where the leads pass over the edges of the die notches are formed on the sides of the leads which face the die, thereby assuring that there is no contact between the leads and the peripheral portion of the top surface of the die. Particularly in power MOSFETs the peripheral portion of the top surface normally contains an equipotential ring which is directly connected to the backside (drain) of the MOSFET, and hence a short between the leads on the top of the die and the equipotential ring would destroy the device. The result is a package that is extremely rugged and that is symmetrical about the axis of the die. To avoid shorting between adjacent leads, moats are formed in the leads where they face the die to prevent liquid epoxy or solder from spreading between the leads. Since no central tie bar is required, multiple dice can readily be packaged in a single plastic capsule.